CLAIMS:

1. An optical scanning device (1) for scanning an information layer (4) of an optical record carrier (2), the device (1) comprising a radiation source (11) for generating a radiation beam (12, 15, 17, 20) and an objective system (18) for converging the radiation beam on the information layer, the objective system (18) being characterised in that the ratio of the root mean square of the optical path difference's (OPD's) generated by the objective system at oblique beam entrance to the system satisfies the condition:

$$\frac{OPD(A51)}{OPD(A31)} < 0.65$$

within the field of the objective system (18), where OPD(A31) is the contribution of the third order Zernike coma to the root mean square wavefront aberration and OPD(A51) is the contribution of the fifth order Zernike coma to the root mean square wavefront aberration.

2. A device (1) as claimed in claim 1, wherein the values of OPD (A31) and OPD (A51) satisfy the condition

$$\frac{OPD(A51)}{OPD(A31)} < 0.4.$$

3. A device (1) as claimed in claim 1, the device further comprising a detection system (25, 27) for converting radiation coming from the information layer to an information signal, and an information processing unit (29) for error correction of the information signal.

4. A device (1) as claimed in claim 1, further comprising an actuating unit arranged to tilt at least one of the objective system (18) and the optical record carrier (2).

5. A lens system (18) comprising at least one lens for focusing a radiation beam, characterised in that the ratio of the root mean square of the optical path difference's (OPD's) generated by the lens system at oblique beam entrance to the system satisfies the condition:

$$\frac{OPD(A51)}{OPD(A31)} < 0.65$$

within the field of the lens system, where OPD(A31) is the contribution of the third order Zernike coma to the root mean square wavefront aberration and OPD(A51) is the contribution of the fifth order Zernike coma to the root mean square wavefront aberration.

6. A lens system (18) as claimed in claim 5, wherein said system is an objective system.

7. A lens system (18) as claimed in claim 5, the system comprising at least a first and a second lens.

8. A method for manufacturing a lens system (18) comprising at least one lens for focusing a radiation beam (17), the method comprising the step of:

forming said lens system such that the ratio of the root mean square of the optical path difference's (OPD's) generated by the lens system at oblique beam entrance to the system satisfies the condition:

$$\frac{OPD(A51)}{OPD(A31)} < 0.65$$

within the field of the lens system, where OPD(A31) is the contribution of the third order Zernike coma to the root mean square wavefront aberration and OPD(A51) is the contribution of the fifth order Zernike coma to the root mean square wavefront aberration.

9. A method as claimed in claim 8, the method further comprising the step of designing the lens system (18) so as to satisfy said condition.

10. A method of manufacturing an optical scanning device (1) for scanning an information layer (4) of an optical record carrier (2), the method comprising the steps of:

providing a radiation source (11) for generating a radiation beam;

providing a lens system (18) for converging the radiation beam on the information layer (4), the lens system (18) being characterised in that the ratio of the root mean square of the optical path difference's (OPD's) generated by the lens system at oblique beam entrance to the system satisfies the condition:

$$\frac{OPD(A51)}{OPD(A31)} < 0.65$$

within the field of the lens system, where OPD(A31) is the contribution of the third order Zernike coma to the root mean square wavefront aberration and OPD(A51) is the contribution of the fifth order Zernike coma to the root mean square wavefront aberration.

11. A method as claimed in claim 10, further comprising the step of providing a unit for holding a record carrier (2) at a predetermined angle with respect to the lens system (18), the predetermined angle being such that coma arising in the beam due to the record carrier at least partially compensates for the coma arising in the beam passing through the lens system.